Idaho Department of Fish and Game
October – December, 2004

Kootenai River Fisheries Recovery Investigations

Quarterly Progress Report and Summary of Activities

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Field Work Completed or in Progress and Summary of Results

White Sturgeon

White sturgeon recovery investigations during this period focused on report writing and data analysis. Field activities were limited to monthly telemetry in the Kootenai River and in Kootenay Lake. Data analysis included movements of white sturgeon released as part of "Set and Jet Program", depth sensitive radio telemetry, and monitoring and evaluation data from the 2004 field season. Protocols for the 2005 field season were also initiated.

Set and Jet Program summary of 2004

Six females and eleven males were transported upstream to the Hemlock Bar reach as part of the Set and Jet Program. Six sturgeon (1 female and 5 males) were transported upstream during an early release period in March and April, and eleven (5 females and 6 males) sturgeon were transported upstream during a late release period in May and June. In summary, males released early tended to stay in the study area longer than those released later in the season. None of the females stayed in the study area longer than 9 days, and eggs were not collected in the study area in 2004. All sturgeon released from the early period were released at rkm 261.8. Four out of the five males moved upstream between rkm 268 and 272, and all spent considerable time near rkm 268.5. This location (rkm 268.5) is near the mouth of John Crown creek and contains deep water (> 3 meters), cobble substrate, and relatively slow current velocities (Figure 1). A pheromone drip station, which contained water and hormones from females housed at the Kootenai Tribal Hatchery facility, was established at rkm 261.8 prior to any sturgeon release in an attempt to keep males and females in the study reach as long as possible. The results from whether this drip station affected white sturgeon behavior are inconclusive.

Figure 1. Kootenai River near mouth of John Crown Creek (rkm 268.5).

Burbot

Sampling for burbot with baited hoop nets began the first week in November. One of our objectives was to begin the season with a much more standardized sampling protocol based on the best catch per unit of effort (CPUE) sampling locations in the past 10 years. With this strategy we feel we can use past CPUE data and future information to use CPUE as an index to population rehabilitation efforts and fulfill this objective in the draft Burbot Conservation Strategy. There are four primary reaches in the Kootenai River from which burbot have been captured and two tributaries (Goat River and Boundary Creek) (Figure 2). In Idaho there are three baited hoop nets deployed at Ambush Rock and one in Boundary Creek. In British Columbia two hoop nets are deployed in the Nick's Island Reach, three between Corn Creek and the Creston boat ramp, two in the vicinity of the confluence of the Goat River with the Kootenai River, and three in the Goat River. A total of three burbot have been captured since sampling began, two at Ambush and one in British Columbia. None were recaptures.

An analysis of Kootenai River burbot demographics and extinction risk was completed with the assistance of S. P. Cramer and associates and was funded by the Kootenai Tribe of Idaho. This analysis was fulfilled to help project the present mortality and

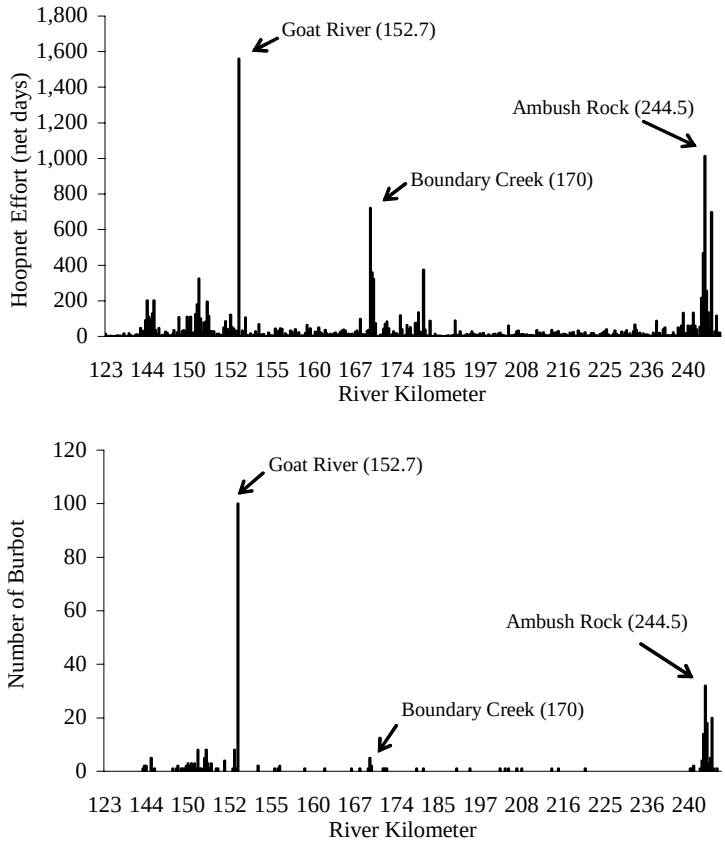

Figure 2. Hoopnet effort and catch by river kilometer, 1993-2004 (includes only IDFG winter hoopnet effort). River kilometers are subtended.

recruitment rates on the future prospects of burbot. We examined the population demographics and vital statistics of Kootenai River burbot from 1993-2004 to determine current numbers and survival rates. Our objective was to determine the time remaining before this population becomes functionally extinct and to help guide conservation efforts. A total of 403 burbot were captured from 1993 through 2004 (primarily with baited hoop nets) of which 31 were not tagged, 300 were tagged, and of the tagged fish 72 were recaptured within the same year of tagging or up to four years later. None of the fish tagged from 1993 through 1995 were ever recaptured, thus these fish were not included in some demographic analysis. Hoop net captures (excluding recaptures) through the study showed an inconsistent but precipitous decline in CPUE ranging from 0.054 CPUE in 1996 to 0.008 CPUE in 2004. We documented a clear trend toward larger fish in our captures with mean length increasing about 8mm/yr from 516 mm in 1993 to 629 mm in 2004. Two demographic models were developed, one which was based on effort through a series of river reaches and one that did not include effort. Of the two estimates the effort estimate appeared to be the most reliable and suggested an average of about 37% annual mortality, an average annual recruitment of 77 fish and an estimate of an average of 148 burbot in the Kootenai River from 1996 through 2004. The

average decline in recruitment was about 21% while the population abundance declined at 14% which resulted in a recruitment of 20 burbot in 2004 and population estimate of about 50 fish. These data indicated Kootenai River burbot are in serious decline which may lead to extirpation if serious rehabilitation measures to intervene extinction are not implemented soon. If not within the decade burbot in the Kootenai River will be extirpated with the exception of a few recruits from the reach in Montana.

Rainbow and Bull Trout

A rainbow trout population estimate for the Hemlock Bar reach of the Kootenai River, Idaho was calculated based on the August electrofishing mark-recapture sample. The population estimate was 335 rainbow trout for the 3 km reach. It appears that the rainbow trout population has been increasing since 1993, the earliest date we have a population estimate for, though confidence intervals are large and three years ago more restrictive angling regulations were imposed on rainbow trout (16 inch length limit and daily creel of two from no length limit and creel of six) (Table 1).

Bull trout redd counts were conducted on North and South Callahan creeks and Boulder Creek on 29 September, 4 October, and 7 October, respectively. Counts for 2004 were lower on North and South Callahan creeks than they were in 2003 (Table 2). Only two bull trout were observed in 2004, both near redds in North Callahan Creek, indicating the spawning season was nearly over when redd counts were conducted.

Other activities completed this quarter for rainbow and bull trout work included completing a draft of the 2003 annual report and entering and summarizing data from the 2004 field season.

Table 1. Rainbow trout mark-recapture population estimates for the Hemlock Bar reach of the Kootenai River, Idaho in the fall, 1993-2004 (a "-" indicates no data).

Year	Population estimate	Lower 95% C. L.	Upper 95% C. L.	n/ha	n/km
1993	98	78	118	3.0	33
1994	135	114	160	5.0	45
1998	217	168	294	7.4	72
1999	217	160	332	7.4	72
2004	335	190	800	11.4	112

Table 2. Bull trout redd counts for streams in the Kootenai River drainage, Idaho, 2000-2004.

Stream	Year	Transect start point Description	Transect end point description	Number of bull trout redds
Boulder Cr.	2000	Mouth	waterfalls 1.9 km upstream.	0
Boulder Cr.	2001	Mouth	waterfalls 1.9 km upstream.	2
Boulder Cr.	2002	Mouth	waterfalls 1.9 km upstream.	2
Boulder Cr.	2003	Mouth	waterfalls 1.9 km upstream.	0
Boulder Cr.	2004	Mouth	waterfalls 1.9 km upstream.	0
N. Callahan Cr.	2002	100 m downstream. of Smith Cr.[a]	Waterfalls barrier	13
N. Callahan Cr.	2003	Jill Cr., Montana	Waterfalls barrier	32
N. Callahan Cr.	2004	Jill Cr., Montana	Waterfalls barrier	17
S. Callahan Cr.	2002	bridge on forest rd. 4554	0.9 km upstream. of forest rd. 414	4
S. Callahan Cr.	2003	bridge on forest rd. 4554	Forest Rd. 414 bridge (trailhead #154)	10
S. Callahan Cr.	2004	bridge on forest rd. 4554	Forest Rd. 414 bridge (trailhead #154)	8

[a] survey reach on North Callahan Creek was shorter in 2002 than in 2003 and 2004.

Ecosystem Rehabilitation

The first week of August, 22 mountain whitefish were surgically implanted with radio tags and released at rkm 265 and 250 (Hemlock Bar and Cow crk) (Figure 3). Tagging was performed to determine if we are sampling a transient population in September or one that is moving through to spawning locations higher up in the drainage. Twenty of the 22 marked whitefish made large downstream movements of 10 rkm and greater with movements decreasing within 14 days of the release date.

Of the 22 marked, 2 made considerable upstream spawning movements. The first moved upstream 8 rkm to the Moyie River in late September, spent approximately 6 days spawning and returned to the precise location it had been located throughout the summer months. The second made its presumed spawning migration to what is believed to be an area in the mainstem of the Kootenai River above the confluence of the Yaak River. This fish started its upstream migration in mid-October, was detected 28.5 rkm above its summering location, and in a similar fashion returned to its exact summering location by the first week of November.

These results indicate that our fall bimonitoring sampling is now being performed at a time that should be prior to spawning, and that our data is that of resident populations (keeping in mind the low sample size). Additionally, this may indicate that mountain whitefish in the Kootenai River may have fidelity to quite specific habitats as well as exhibiting both tributary and mainstem spawning.

The majority of this quarter was spent working on securing permits for the nutrient restoration project. Several

meetings were held with the Idaho DEQ, city of Bonners Ferry, and the general public to receive feedback on questions and concerns that individuals or agencies may have. In general, we have received very good support on the entire project. Concerns that are brought up will be addressed in the environmental assessment being written by BPA.

Construction on the project is slotted for April of 2005 providing that all the permits are secured. Permits include: statement of consent from DEQ, Section 10 permit from the ACOE, special use permit from USFS, finding of no adverse affect from USFWS, and a finding of no significant impact from the Montana State Historic Preservation Office.

Figure 3. Radio tagged male mountain whitefish at Hemlock Bar, Kootenai River.

Meetings Held/Attended, Communication, and Accomplishments for the Quarter:

- Pete assisted USGS videotaping spawning substrate in the Kootenai River
- Pete and Vaughn attended a meeting with USGS in Boise to discuss hydrologic models of the Kootenai River and white sturgeon spawning location and telemetry
- Vaughn and Pete attended meeting with KRWSRT members to discuss Kootenai River white sturgeon database structure and function
- Vaughn had a ms. accepted for publication; Transactions of the American Fisheries Society – Depth sensitive transmitters and white sturgeon behavior and Vaughn and Ryan Journal of Fish Biology (Fisheries Society of the British Isles) Burbot Migration and discharge
- Vaughn attended a Principals meeting and a Managers meeting
- Jody submitted a press release explaining funding sources for fisheries work.
- Vaughn met with two biologists from Montana and gave them some pointers on burbot sampling with hoop nets and cod traps
- Ryan gave a presentation at the Kootenai Valley Sportsman's club to rally support and provide information on the nutrient restoration program.
- Ryan attended the KVRI meeting in Bonners Ferry at which we (KTOI and IDFG) presented details on the nutrient restoration program (December, 2004).
- Vaughn attended and helped with the publics questions while Ryan provided information on the nutrient restoration to the community at a public meeting held at the Boundary County Extension Office (December, 2004).
- Ryan gave a presentation to the City of Bonners and the DEQ on the details of the nutrient restoration program and laid groundwork for monitoring plan (November, 2004).

Next Quarter Activities and Meetings:

White sturgeon

- Hire field staff
- Finish protocols for 2005 field sampling season
- 0rder equipment and materials for 2005 field sampling season
- Complete draft of 2004 annual report
- Begin adult sampling in March.

Rainbow and Bull Trout

- Complete the 2003 annual report
- Plan objectives and field work for 2005
- Continue entering and summarizing 2004 data

Burbot

- Begin larval tows in March
- Complete draft of burbot demographics report
- Continue with coordination with the University of Idaho and burbot DNA analysis

Ecosystem Rehabilitation

- This quarter we are planning on the purchase of fertilizer, tanks, and other related equipment in order to be prepared for the April construction date
- Permitting, NEPA scoping process, Biological Assessment of nutrient replacement efforts in 2005.
- Zooplankton and rotifer sampling and identification will continue.
- Finish draft of 2003/04 annual report.
- Attend 2004 fisheries research training in Boise.
- Attend 2004 ICAFS in Boise.

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Colin Spence (BC Fisheries)
Brian Marotz (MFWP, Kalispell)
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Gary Barton (USGS)
Boundary County Commissioners